

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* YASUYUKI OHIRA  
and MITSUO HORI

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Appeal 2007-2200  
Application 09/924,826  
Technology Center 1700

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Decided: November 30, 2007

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Before BRADLEY R. GARRIS, CHUNG K. PAK, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

1 Appellants appeal under 35 U.S.C. § 134 the final rejection of claims 1-3, 6, 8-12, 14, 17-22, 24-31, and 33-36. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

## INTRODUCTION

Appellants claim a method of energy conversion that comprises applying energy to an energy conversion material comprising a base material and a moment activator in an amount of 10 to 500 parts by weight per 100 parts by weight of the base material (claim 1). The base material contains dipoles that are displaced by the application of energy to the material (Spec. 5; Figures 1 & 2). The applied energy is absorbed by displacing the dipoles (Spec. 5). The moment activator increases the magnitude of the dipole moment thereby controlling the amount of dampening (Spec. 6).

Claims 1 and 36 are illustrative:

1. A method of energy conversion comprising:

applying energy to an energy conversion material comprising a base material and 10 to 500 parts by weight per 100 parts by weight of the base material of a moment activator selected from the group consisting of N, N-dicyclohexylbenzothiazyl-2-sulfonamide (DCHBSA), 2-mercaptobenzo-thiazole (MBT), dibenzothiazylsulfide (MBTS), N-cyclohexylbenzothiazyl-2-sulfenamide (CBS), N-tert-butylbenzothiazyl-2-sulfenamide (BBS), N-oxydiethylenebenzothiazyl-2-sulfonamide (OBS), or N, N-diisopropyl-benzothiazyl-2-sulfenamide (DPBS), 2-(2'-hydroxy-3'-(3", 4", 5", 6" tetrahydrophthalimidemethyl)-5'-methylphenyl)-benzotriazole (2HPMMB), 2-2'-hydroxy-5' methylphenyl)-benzotriazole (2HMPB), 2-(2'-hydroxy-3'-t-butyl-5'-methylphenyl)-5-chlorobenzotriazole (2HBMPCB), 2-(2'-hydroxy-3',5'-di-t-butylphenyl)-5-chlorobenzotriazole (2HDBPCB), and ethyl-2-cyano-3,3- di-phenylacrylate, wherein said energy conversion material has dipoles in a stable state;

displacing the dipoles to an unstable state; and

returning the dipoles to a stable state wherein said energy conversion material is in the form of a sheet, fiber or combination thereof and the sheet has a thickness of 1 millimeter or greater.

36. A method of vibration damping comprising:

applying vibrational energy to a vibration damping material comprising acrylic rubber and 10 to 500 parts by weight per 100 parts by weight of the acrylic rubber of N, N-dicyclohexylbenzothiazyl-2-sulfonamide (DCHBSA), wherein said vibration damping material has dipoles in a stable state;

displacing the dipoles to an unstable state; and

returning the dipoles to a stable state.

The Examiner relies on the following prior art references as evidence of unpatentability:

Minatono	4,218,349	Aug. 19, 1980
Cooper	4,430,466	Feb. 7, 1984
Kang	4,602,054	Jul. 22, 1986
Kamijima	5,439,512	Aug. 8, 1995
Okuda	5,858,521	Jan. 12, 1999

The rejections as presented by the Examiner are as follows:

1. Claims 1-3, 6, 8-12, 14, 17-22, 24-31, and 33-35 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
2. Claims 1-3, 6, 8-12, 14, 17-22, 24-31, and 33-35 are rejected under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 1, 2, 6, 8, 12, 14, 17-22, 25-27, 29-31, 33-36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kamijima.

4. Claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cooper in view of Okuda.
5. Claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuda.
6. Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Cooper in view of Okuda and Kang.
7. Claim 28 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Cooper in view of Okuda and Minatono.
8. Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuda in view of Kang.
9. Claim 28 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuda in view of Minatono.

Appellants only argue independent claim 1. Accordingly, dependent claims 2-3, 6, 8-12, 14, 17-22, 24-31, 33-35, and independent claim 36, stand or fall with claim 1 for each applicable rejection except the rejection over Kamijima. Though claim 36 has not been separately argued, in light of the circumstances presented in this appeal, we separately treat independent claim 36 only with regard to the Kamijima rejection.

#### OPINION

##### 35 U.S.C. § 112, FIRST PARAGRAPH, REJECTION

The Examiner determined that the claim feature “the sheet has a thickness of 1 millimeter or greater” failed to comply with the written description requirement of 35 U.S.C. § 112, first paragraph (Ans. 3). The

Examiner determined that the Specification only has support for thicknesses of 1 mm, 5 mm, and 10 mm, not for the open-ended range (i.e., “1 mm or greater”) (Ans. 3).

We cannot sustain the Examiner’s § 112, first paragraph, rejection of the claims as failing to comply with the written description requirement.

When determining whether an applicant has written description support for a range, “mere comparison of ranges is not enough, nor are mechanical rules a substitute for an analysis of each case on its facts to determine whether an application conveys to those skilled in the art the information that the applicant invented the subject matter of the claims.” *In re Wertheim*, 541 F.2d 257, 263, (CCPA 1976). It must be determined whether the invention an applicant seeks to protect by the claims is part of the invention that applicant has described in the Specification. *Id.*

In the present appeal, Appellants’ originally filed claim 1, for example, does not recite a range of thicknesses for the energy conversion material (Claim 1 filed August 8, 2001), such that any thickness of the energy conversion material is included by the claim. In other words, the originally filed claims, which are part of the original disclosure, are broader than the currently amended claims on appeal and indicate that Appellants’ invention includes any thickness of the energy conversion material.

Additionally, Appellants’ Specification discloses that “[t]he size or shape of the vibration-proof material may be controlled to provide different resonance frequency properties and may thus be determined as appropriate depending on applications or use conditions” (Spec. 73). Appellants further disclose that the material may be molded into cylinders having thicknesses of 2 mm, 3 mm, 5 mm, 6 mm, and 12.7 mm (Spec. 89). Appellants also

disclose an embodiment where the material is molded into plates having 1 mm, 3 mm, 5 mm, and 10 mm thicknesses (Spec. 94).

All of these disclosures indicate that the claim feature “the sheet has a thickness of 1 millimeter or greater” is part of the invention that Appellants have described in their Specification. *Wertheim*, 541 F.2d at 263. Accordingly, we determine that Appellants’ claims comply with the written description requirement of 35 U.S.C. § 112, first paragraph.

We reverse the Examiner’s § 112, first paragraph, rejection of claims 1-3, 6, 8-12, 14, 17-22, 24-31, and 33-35 as failing to comply with the written description requirement.

#### 35 U.S.C. § 112, SECOND PARAGRAPH, REJECTION

The Examiner determines that the claim 1 feature, “said energy conversion material is in the form of a sheet, fiber or combination thereof and the sheet has a thickness of 1 millimeter or greater” amounts to a narrow limitation within a broad limitation in the same claim and, thus, fails to comply with the requirement of § 112, second paragraph, to particularly point out and distinctly claim the subject matter which applicant regards as the invention (Ans. 3-4, 10).

For the reasons below, we cannot sustain the Examiner’s § 112, second paragraph, rejection.

The claim language “the sheet has a thickness of 1 millimeter or greater” clearly refers to the “sheet” recited earlier in claim 1. Accordingly, like Appellants argue (Br. 4; Reply Br. 6), we construe “the sheet has a thickness of 1 mm or greater” as stating that if the energy conversion material is in sheet form or a combination of fiber and sheet form, then the

thickness of the sheet must be 1 millimeter or greater. This claim language is clear and particularly points out and distinctly claims the subject matter which Appellants regard as the invention.

Accordingly, we conclude that Appellants' claim language complies with the requirements of 35 U.S.C. § 112, second paragraph. We reverse the Examiner's rejection of claims 1-3, 6, 8-12, 14, 17-22, 24-31, and 33-35 as failing to comply with the requirement of 35 U.S.C. § 112, second paragraph, to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

#### 35 U.S.C. § 103 REJECTION OVER KAMIJIMA CLAIM 1

The Examiner finds that Kamijima discloses an anti-fouling paint that satisfies all that is recited in claim 1, except for the claimed thickness (Ans. 4-5). The Examiner concludes that it would have been obvious to determine, through routine experimentation, the proper paint thickness to provide the desired degree of anti-fouling properties and to minimize the number of reapplications of the paint (Ans. 5).

We cannot sustain the Examiner's § 103 rejection of claim 1 and the claims that depend from claim 1 over Kamijima.

Kamijima discloses an anti-fouling paint that is used, for example, to coat ship bottoms or fishing nets (Kamijima, col. 11, ll. 17-18).

Both Appellants and the Examiner agree that the thickest paint coating disclosed by Kamijima is 100  $\mu\text{m}$  (Kamijima, col. 21, ll. 40-41). To satisfy the minimum coating thickness claimed by Appellants (i.e., 1 mm), Kamijima's thickest coating would need to be increased ten fold.

As Appellants have argued (Br. 5; Reply Br. 7 & 8), we determine that there is no reasonable expectation that increasing Kamijima's paint thickness by a factor of ten would successfully produce a coating that better resists fouling or requires fewer reapplications of the paint. Rather, we agree with Appellants that increasing the paint thickness at least ten fold would produce an increase in the weight and drag of the boat (Reply Br. 7) and thus not motivate one of ordinary skill in the art to make such a drastic increase in the coating thickness. As disclosed by Kamijima, an increase in drag would hinder the fuel economy and the cruising performance of the ship (Kamijima, col. 1, ll. 20-23), which further militates against such a drastic ten fold increase in the paint thickness. *In re Sebek*, 465 F.2d 904, 907 (CCPA 1972).

For the foregoing reasons, we determine there is no motivation or a reasonable expectation of success to increase Kamijima's paint thickness ten fold. Accordingly, we reverse the Examiner's § 103(a) rejection of claims 1, 2, 6, 8, 12, 14, 17-22, 25-27, 29-31, and 33-35 over Kamijima.

#### CLAIM 36

Claim 36, the only other independent claim on appeal, is rejected under § 103(a) over Kamijima.

However, Appellants' only arguments concerning the Kamijima rejection are whether there is motivation and a reasonable expectation of success to increase the thickness of Kamijima's paint thickness ten fold (Br. 5; Reply Br. 7-8). Claim 36 does not recite a thickness for the energy conversion material.



Accordingly, Appellants' arguments directed to the thickness feature of claim 1 are not relevant to the rejection of claim 36. Therefore, because Appellants have not advanced any arguments evincing an error in the Examiner's § 103 rejection of claim 36 over Kamijima, we affirm the Examiner's § 103(a) rejection of claim 36 over Kamijima.

### 35 U.S.C. § 103(a) REJECTION OVER OKUDA

Appellants argue that Okuda's vulcanization accelerators, which Appellants do not contest correspond to the claimed moment activator, do not affect the physical properties of the material (e.g., the amount of product formed), but rather, only affect how fast the vulcanizing proceeds (Br. 6). Appellants argue that Okuda only discloses using 5 parts by weight of the vulcanizing accelerator, which is half the lowest claimed amount (i.e., 10 parts by weight) (Br. 7). Appellants contend that the Examiner has failed to establish a *prima facie* case of obviousness because all claim elements are not disclosed in the prior art, there is no motivation to modify Okuda's amount of vulcanizing accelerator to be greater than 5 parts by weight, and there is no reasonable expectation that adding more vulcanizing accelerator would successfully provide a material having better dampening properties (Br. 7 and Reply Br. 9 & 10). Appellants do not contest the Examiner's determination that since Okuda's vibration damper material is the same as Appellants' energy conversion material, the claimed properties of displacing and returning of the dipoles within the material upon energy impact are inherent in Okuda's material (Ans. 8).

We have considered all of Appellants' arguments and are unpersuaded for the reasons below.

Regarding Appellants' argument that there is no motivation to increase Okuda's amount of vulcanizing accelerator, we agree with the Examiner that reducing the amount of time for the vulcanizing reaction by adding more vulcanizing accelerators would have provided motivation for having made such an increase in the vulcanizing accelerators (i.e., moment activators) (Ans. 11).

Furthermore, contrary to Appellants' argument that Okuda only discloses using 5 parts by weight of the vulcanizing accelerator, the Examiner finds that Okuda discloses approximately 8.3 parts by weight of vulcanizing accelerator per 100 parts (i.e., 5 parts by weight of vulcanizing accelerator per 60 parts of base material (Okuda, col. 14, ll. 34-35, 39)) (Ans. 8). Appellants have not challenged this finding of the Examiner.

We add that, by its very name, vulcanizing accelerators affect the rate at which the vulcanization reaction occurs. Appellants agree that vulcanizing accelerators affect the rate of a vulcanization reaction (Br. 6). In other words, the amount of vulcanizing accelerator is an art recognized result effective variable such that it would have been obvious to optimize Okuda's amount of vulcanizing accelerator by increasing the amount from 8.3 parts to 10 parts to affect the rate of the vulcanizing reaction. *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980).

Moreover, using the Examiner's undisputed finding that Okuda's vulcanizing accelerator (i.e., moment activator) amount is 8.3 parts, we conclude that it would have been obvious to increase Okuda's disclosed amount (i.e., 8.3 parts) of vulcanizing accelerator (i.e., moment activator) to

10 parts vulcanizing accelerator (i.e., moment activator) as claimed because the amounts are so close. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 783 (Fed. Cir. 1985). Specifically, Okuda's disclosed amount (i.e., 8.3 parts) of vulcanizing accelerator (i.e., moment activator) is so close to the minimum claimed amount (i.e., 10 parts) of moment activator (i.e., vulcanizing accelerator) that one of ordinary skill in the art would have expected a vibration damper material having 10 parts vulcanizing accelerator to have the same vulcanization accelerating properties as Okuda's vibration dampening material having 8.3 parts vulcanizing accelerator such that the claimed amount of moment activator (i.e., vulcanizing accelerator) would have been obvious. *Id.*

Therefore, contrary to Appellants' argument and for the above reasons, there is a reasonable expectation that increasing the amount of the vulcanizing agent would successfully increase the rate of the vulcanization reaction.

For the above reasons, we affirm the Examiner's § 103(a) rejection of claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-35 over Okuda.

### 35 U.S.C. § 103 REJECTION OVER COOPER IN VIEW OF OKUDA

The Examiner finds that Cooper discloses all that is recited in claim 1, except for the amount of vulcanizing accelerator (i.e., moment activator) as claimed. The Examiner relies on Okuda's disclosure that vulcanizing agents and accelerators affect the vibration dampening properties of the rubber to support the conclusion that it would have been obvious to determine the desired level of vulcanizing agents and accelerators to achieve the desired degree of vulcanization and, thus, vibration dampening (Ans. 6).

We cannot sustain the Examiner's § 103 rejection over Cooper in view of Okuda.

As Appellants argue, Cooper does not disclose the claimed amount of moment activator (i.e., vulcanizing accelerator in Cooper) (i.e., 10 to 500 parts by weight per 100 parts by weight of the base material) (Br. 6). Though Cooper broadly states that the vulcanizing accelerator is present in an amount of "over 1.5 phr [i.e., parts per hundred rubber]," the highest amount of vulcanizing accelerator (i.e., moment activator) that Cooper exemplifies is 5 parts by weight (i.e., parts per hundred rubber) (Cooper, col. 5, l. 25). In other words, Cooper modifies the broad disclosure of "over 1.5 phr" by indicating that an acceptable range for the vulcanizing accelerator is between "1.6 to 5 parts by weight [i.e., phr]." Accordingly, one of ordinary skill in the art would not have been motivated to increase the vulcanizing accelerator (i.e., moment activator) to 10 to 500 parts (i.e., phr). *Sebek*, 465 F.2d at 907.

Though, as noted above, Okuda does disclose using an amount (i.e., 8.3 parts by weight) of vulcanizing accelerator (i.e., moment activator) that is very close to the claimed amount of 10 parts by weight, Cooper's disclosure that 5 parts by weight is the exemplified amount of vulcanizing accelerator (i.e., moment activator) militates against combining Okuda's larger amount of vulcanizing accelerator (i.e., moment activator). *Sebek*, 465 F.2d at 907.

For the foregoing reasons, we determine there is no motivation or reason for increasing Cooper's vulcanizing accelerator (i.e., moment activator) to 10 to 500 parts. Accordingly, we reverse the Examiner's § 103

rejection of claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-36 over Cooper in view of Okuda.

#### REMAINING § 103 REJECTIONS OF DEPENDENT CLAIMS 24 & 28

Appellants do not separately argue the following rejections: (1) claim 24 under § 103 over Cooper in view of Okuda and Kang; (2) claim 28 under § 103 over Cooper in view of Okuda and Minatono; (3) claim 24 under § 103 over Okuda in view of Kang; and (4) claim 28 under § 103 over Okuda in view of Minatono.

Rather, Appellants merely indicate that Kang and Minatono fail to cure the deficiencies argued by Appellants regarding the § 103 rejections over Okuda or Cooper in view of Okuda of independent claim 1, upon which claims 24 and 28 ultimately depend (Br. 7).

Regarding the § 103 rejection over Okuda, we affirmed the Examiner's rejection of claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-35. Accordingly, we affirm the following Examiner's rejections: (1) claim 24 under § 103 over Okuda in view of Kang, and (2) claim 28 under § 103 over Okuda in view of Minatono.

Regarding, the § 103 rejection over Cooper in view of Okuda, we reversed the Examiner's rejection of claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-36. Accordingly, we reverse the following Examiner's rejections: (1) claim 24 under § 103 over Cooper in view of Okuda and Kang, and (2) claim 28 under § 103 over Cooper in view of Okuda and Minatono.

DECISION

We REVERSE the Examiner's § 112, first paragraph, rejection of claims 1-3, 6, 8-12, 14, 17-22, 24-31, and 33-35 as failing to comply with the written description requirement.

We REVERSE the Examiner's § 112, second paragraph, rejection of claims 1-3, 6, 8-12, 14, 17-22, 24-31, and 33-35 as failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

We REVERSE the Examiner's § 103(a) rejection of claims 1, 2, 6, 8, 12, 14, 17-22, 25-27, 29-31, and 33-35 over Kamijima.

We AFFIRM the Examiner's § 103(a) rejection of claim 36 over Kamijima.

We REVERSE the Examiner's § 103(a) rejection of claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-36 over Cooper in view of Okuda.

We REVERSE the Examiner's § 103(a) rejection of claim 24 over Cooper in view of Okuda and Kang.

We REVERSE the Examiner's § 103(a) rejection of claim 28 over Cooper in view of Okuda and Minatono.

We AFFIRM the Examiner's § 103(a) rejection of claims 1-3, 6, 8-12, 14, 17-19, 21, 22, 25-27, 29-31, and 33-35 over Okuda.

We AFFIRM the Examiner's § 103(a) rejection of claim 24 over Okuda in view of Kang.

We AFFIRM the Examiner's § 103(a) rejection of claim 28 over Okuda in view of Minatono.

The Examiner's decision is affirmed-in-part.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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